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☐ 1. Document ID: US 20040176888 A1

L5: Entry 1 of 5

File: PGPB

Sep 9, 2004

PGPUB-DOCUMENT-NUMBER: 20040176888  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040176888 A1

TITLE: Method and apparatus for alarming decrease in tire air-pressure and program for alarming decrease in tire air-pressure

PUBLICATION-DATE: September 9, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Sugisawa, Toshifumi	Kobe-shi		JP

APPL-NO: 10/790048 [PALM]  
DATE FILED: March 2, 2004

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	DOC-ID	APPL-DATE
JP	2003-055498	2003JP-2003-055498	March 3, 2003

INT-CL: [07] G06 F 7/00

US-CL-PUBLISHED: 701/031

US-CL-CURRENT: 701/31

REPRESENTATIVE-FIGURES: 2

ABSTRACT:

A method for alarming decrease in tire air-pressure in which decrease in tire air-pressure is determined on the basis of rotational velocity information of a wheel of a vehicle. Respective thresholds for determining whether judgment of decrease in tire air-pressure is to be made or not are changed depending on magnitude of driving torque of the vehicle when the vehicle is performing turning movements. It is possible to improve the detection accuracy without issuing an erroneous alarm even in the case where a large driving force is applied when the vehicle is, for instance, running on a climbing road or when it performs trailer towing.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw Desc	Image
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☐ 2. Document ID: US 20030233209 A1

L5: Entry 2 of 5

File: PGPB

Dec 18, 2003

PGPUB-DOCUMENT-NUMBER: 20030233209  
 PGPUB-FILING-TYPE: new  
 DOCUMENT-IDENTIFIER: US 20030233209 A1

TITLE: Method and apparatus for detecting decrease in tire air-pressure and program for judging decompression of tire

PUBLICATION-DATE: December 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Yanase, Minao	Kobe-shi		JP

APPL-NO: 10/459460 [PALM]  
 DATE FILED: June 12, 2003

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	DOC-ID	APPL-DATE
JP	2002-173084	2002JP-2002-173084	June 13, 2002

INT-CL: [07] G01 P 3/00

US-CL-PUBLISHED: 702/145  
 US-CL-CURRENT: 702/145

REPRESENTATIVE-FIGURES: 1

ABSTRACT:

A method for detecting decrease in tire air-pressure in which decrease in internal pressure of a tire is detected on the basis of wheel speed information obtained from wheels attached to a vehicle. The method includes the steps of: detecting wheel speed information of the respective tires; storing the wheel speed information of the respective tires; obtaining a vehicle body velocity of the vehicle; obtaining vehicle information of the vehicle during running such as driving force, wheel torque or slip rate; calculating a judged value of decompression; and detecting decrease in air-pressure of a tire upon calculating a multiple correlation coefficient for the judged value between the vehicle body velocity and the vehicle information and comparing the multiple correlation coefficient with a specified threshold. It is possible to accurately detect decompression of a tire.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw Desc	Image
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☐ 3. Document ID: US 20030033071 A1

L5: Entry 3 of 5

File: PGPB

Feb 13, 2003

PGPUB-DOCUMENT-NUMBER: 20030033071  
 PGPUB-FILING-TYPE: new  
 DOCUMENT-IDENTIFIER: US 20030033071 A1

TITLE: Apparatus and method for judging road surface gradients, and program for judging gradients

PUBLICATION-DATE: February 13, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Kawasaki, Hiroaki	Kobe-shi		JP

APPL-NO: 10/174939 [PALM]

DATE FILED: June 20, 2002

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	DOC-ID	APPL-DATE
JP	2001-189403	2001JP-2001-189403	June 22, 2001

INT-CL: [07] G06 F 17/00

US-CL-PUBLISHED: 701/80; 73/105

US-CL-CURRENT: 701/80; 73/105

REPRESENTATIVE-FIGURES: 3

## ABSTRACT:

An apparatus for judging road surface gradients including a speed detecting means for periodically detecting wheel speeds of four wheels of a vehicle, a vehicle body speed calculating means for obtaining a vehicle body speed of the vehicle, a slip rate calculating means for obtaining a slip rate, a means for calculating acceleration of the vehicle body for obtaining an acceleration of the vehicle body of the vehicle, a determining means for determining whether the acceleration of the vehicle body is within a specified range proximate to zero, and a gradient judging means for judging a gradient of a road surface on the basis of the determination of the determining means. The gradients of road surfaces might be judged without using various sensors but only on the basis of information which can be obtained from a speed detecting means for detecting wheel speeds.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 4. Document ID: US 6738704 B2

L5: Entry 4 of 5

File: USPT

May 18, 2004

US-PAT-NO: 6738704

DOCUMENT-IDENTIFIER: US 6738704 B2

TITLE: Apparatus and method for judging road surface gradients, and program for judging gradients

DATE-ISSUED: May 18, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kawasaki, Hiroaki	Kobe			JP

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Sumitomo Rubber Industries, Ltd.	Hyogo-ken			JP	03

APPL-NO: 10/174939 [PALM]

DATE FILED: June 20, 2002

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	2001-189403	June 22, 2001

INT-CL: [07] B60 T 8/58

US-CL-ISSUED: 701/80

US-CL-CURRENT: 701/80

FIELD-OF-SEARCH: 701/74, 701/80, 303/163, 303/191, 303/192

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>5132906</u>	July 1992	Sol et al.	701/80
<u>5703776</u>	December 1997	Soung	701/65
<u>6188316</u>	February 2001	Matsuno et al.	340/441
<u>6249735</u>	June 2001	Yamada et al.	701/65
<u>6510374</u>	January 2003	Saotome et al.	701/80
<u>6604595</u>	August 2003	Sakakiyama	180/233

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
04-145323	May 1992	JP	
05-142021	June 1993	JP	
06-144087	May 1994	JP	
06-147304	May 1994	JP	
06-63766	August 1994	JP	
09-242862	September 1997	JP	

ART-UNIT: 3661

PRIMARY-EXAMINER: Zanelli; Michael J.

ATTY-AGENT-FIRM: Birch, Stewart, Kolasch &amp; Birch, LLP

## ABSTRACT:

An apparatus for judging road surface gradients including a speed detector for periodically detecting wheel speeds of four wheels of a vehicle, a vehicle body speed calculator for obtaining a vehicle body speed of the vehicle, a slip rate calculator for obtaining a slip rate, a vehicle body acceleration calculator for obtaining an acceleration of the vehicle body of the vehicle, a determining device for determining whether the acceleration of the vehicle body is within a specified range proximate to zero, and a gradient judging device for judging a gradient of a road surface depending on the determination of the determining device. The gradients of road surfaces might be judged without using various sensors but only on the basis of information which can be obtained from a speed detector for detecting wheel speeds.

15 Claims, 4 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Image	Claims	KMC	Draw Desc	Image
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☐ 5. Document ID: US 20040176888 A1, EP 1454773 A2, JP 2004262362 A

L5: Entry 5 of 5

File: DWPI

Sep 9, 2004

DERWENT-ACC-NO: 2004-644377

DERWENT-WEEK: 200463

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TITLE: Reduction alarming method of tire air pressure in vehicle wheel, involves changing respective thresholds for determining whether or not decrease of tire air pressure is to be made depending on magnitude of driving torque of vehicle

INVENTOR: TOSHIFUMI, S; SUGISAWA, T

PATENT-ASSIGNEE: SUMITOMO RUBBER IND LTD (SUMR), SUGISAWA T (SUGII)

PRIORITY-DATA: 2003JP-0055498 (March 3, 2003)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>US 20040176888 A1</u>	September 9, 2004		000	G06F007/00
<u>EP 1454773 A2</u>	September 8, 2004	E	011	B60C023/06
<u>JP 2004262362 A</u>	September 24, 2004		008	B60C023/06

DESIGNATED-STATES: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PL PT RO SE SI SK TR

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
US20040176888A1	March 2, 2004	2004US-0790048	
EP 1454773A2	March 1, 2004	2004EP-0004658	
JP2004262362A	March 3, 2003	2003JP-0055498	

INT-CL (IPC): B60 C 19/00; B60 C 23/06; G01 L 17/00; G06 F 7/00

ABSTRACTED-PUB-NO: EP 1454773A

BASIC-ABSTRACT:

NOVELTY - The method involves determining a decrease in tire air pressure based on the rotational velocity information of vehicle wheel. The respective thresholds for determining whether or not a decrease of tire air pressure is to be made are changed depending on the magnitude of driving torque of the vehicle when carrying out turning movement.

DETAILED DESCRIPTION - DEPENDENT CLAIMS are also included for the following:

- (a) Apparatus for alarming decrease in tire air pressure; and
- (b) Program for alarming a decrease in tire air pressure.

USE - For alarming reduction of tire air pressure in vehicle wheel.

ADVANTAGE - Improve detection accuracy without issuing an erroneous alarm even if the vehicle is running on a climbing road or performing trailer towing.

DESCRIPTION OF DRAWING(S) - The figure is a block diagram of the electric arrangements of the apparatus for alarming decrease in tire air pressure.

- Control unit 2
- Input-output switch 2a
- CPU 2b
- Alarm display 3
- Initialization switch 4

ABSTRACTED-PUB-NO: EP 1454773A  
EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.2/4

DERWENT-CLASS: Q11 X22  
EPI-CODES: X22-E02B;

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Assignments	Claims	KWIC	Draw Desc	Clip Img	Image
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<u>L5</u>	l3 and L4	5	<u>L5</u>
<u>L4</u>	driving adj torque	21629	<u>L4</u>
<u>L3</u>	l1 and L2	48	<u>L3</u>
<u>L2</u>	rotational adj velocity	15458	<u>L2</u>
<u>L1</u>	tire adj air adj pressure	1899	<u>L1</u>

END OF SEARCH HISTORY